

Washington Pygmy Rabbit 2003 Recovery Plan Update

Addendum to
Washington State Recovery Plan for the Pygmy Rabbit (1995)



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EXECUTIVE SUMMARY

This document summarizes 2002 recovery efforts for the Columbia Basin pygmy rabbit, and outlines new tasks to be completed in 2003. The initial (1995) *Washington State Recovery Plan for the Pygmy Rabbit* was updated with the 2001 Addendum, *Emergency Measures for Species Survival*. This is the second addendum to the 1995 recovery plan.

The pygmy rabbit was listed as a threatened species in the state in 1990 and was reclassified to endangered status in 1993. It was listed under emergency provisions of the federal Endangered Species Act in November 2001 by the U.S. Fish and Wildlife Service, with a final rule continuing the endangered listing in March 2003. A state recovery plan for the rabbit was written in 1995. Recovery objectives are to increase pygmy rabbit numbers and distribution and manage habitat for long-term protection of features that support pygmy rabbits.

Less than 30 Columbia Basin pygmy rabbits are believed to remain in the wild. A captive breeding program was initiated in 2001. The captive breeding program is a cooperative project involving the WDFW (lead agency), and Washington State University, the Oregon Zoo, and Northwest Trek Wildlife Park, where captive breeding occurs.

The 2002 breeding season was the first breeding season for Columbia Basin pygmy rabbits. Eighteen rabbits were paired beginning in early March, but breeding did not occur until mid-April. The first litters were born between May 1 and 3. Of 12 different pairings at Washington State University, only two produced young. One of the pairs produced stillborn young and the other pair produced 5 young. One re-pairing later in the spring produced only stillborn young. At the Oregon Zoo, eight pairings were attempted with only two pairings producing a total of 10 young. Re-matings were not successful, with one re-mating producing two stillborn young. A total of fifteen young Columbia Basin pygmy rabbits were born in 2002, but disease in the captive population, most notably avian tuberculosis, eliminated numerical gains in the captive population and reduced genetic diversity.

Additional recovery efforts included rearing and releasing captive Idaho pygmy rabbits back into Idaho as an experiment, to test and improve release methods. A total of 20 Idaho pygmy rabbits born in captivity in 2002 were released in two groups at the Idaho National Environmental Engineering Laboratory near Idaho Falls, Idaho. The first group of 13 rabbits was released August 9 and the second group of 7 was released September 16. Four rabbits survived to breeding season 2003. Plans for 2003 are for a similar experiment to further test release methods.

Funds for habitat acquisition were secured in 2003, which could potentially assist in developing a second release site for pygmy rabbits. Surveys conducted during winter 2001-2002 at Sagebrush Flat Wildlife Area located 23 active burrows in three general areas. Visitation to these three areas during the winter of 2002-2003 found active burrows in one of the three general areas. Surveys of potential habitat continued in 2002 by both WDFW and the Bureau of Land Management, but no new pygmy rabbits were found. Genetic analyses indicate that genetic drift has occurred in the captive population, resulting in a significant decline in genetic diversity. New initiatives for 2003 include conducting experimental cross-breeding of pygmy rabbits from the Columbia Basin with those from Idaho, expanding captive breeding facilities at Northwest Trek Wildlife Park, and developing agreements with private landowners to survey for other pygmy rabbits in the wild.

ACKNOWLEDGMENTS

This report summarizes work of a number of people. Captive breeding at Washington State University is headed by Dr. Lisa Shipley and Dr. Rodney Saylor, with graduate students Rob Westra, Becky Elias, Tara Davila, facilities manager Gary Rademaker and veterinarian Nina Woodford. Captive breeding at the Oregon Zoo is coordinated between Blair Csuti, David Shepherdson and Jan Steele, with Keepers, Michael Illig, Patricia Swenson, and Rachel Lamson, and veterinarians Lisa Harrenstein and Mitch Finnegan. Captive breeding at Northwest Trek Wildlife Park is conducted by Ed Cleveland. Field surveys for the pygmy rabbit were conducted by Beau Patterson, Laura Cooke, Steve Goodman, Tom McCall, and BLM biologist John Musser. Management of Sagebrush Flat Wildlife Area is conducted by Marc Hallet and Dan Peterson. Genetic studies of pygmy rabbits is conducted by Dr. Ken Warheit. WDFW veterinarian Kristin Mansfield coordinates veterinary issues for pygmy rabbits.

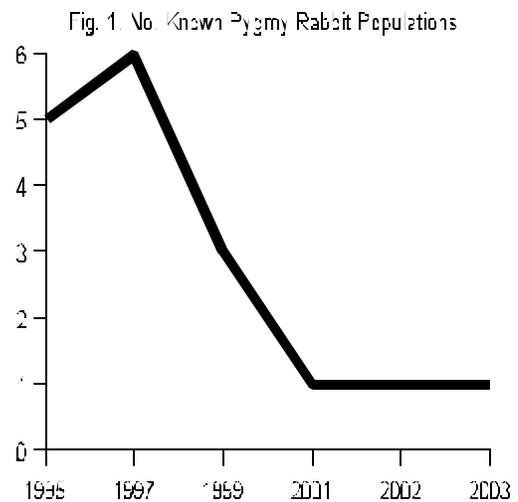
1.0 BACKGROUND

The purpose of this document is to summarize the current status of pygmy rabbits in Washington, summarize recovery activities in 2002, and outline tasks essential to undertake in 2003. This is the second addendum to the 1995 recovery plan. The first, entitled “Washington Pygmy Rabbit; Emergency Action Plan for Species Survival” was published in August 2001. The original recovery goals for downlisting from endangered to threatened and sensitive have not changed from the 1995 Recovery Plan. However, the current focus is to prevent extinction of Washington’s pygmy rabbits.

1.1 Status

The U.S. Fish and Wildlife Service (USFWS) listed the pygmy rabbits in the Columbia Basin of Washington under emergency provisions of the Endangered Species Act in November 2001. Emergency provisions were for an 8 month period, pending review and development of a final status decision. A final decision to list the Columbia Basin pygmy rabbit as federally endangered was issued in March 2003. A state recovery plan for the rabbit was written in 1995 and efforts have been underway to implement the plan despite less than full funding.

In 1995, five pygmy rabbit populations were known to exist in Douglas and northern Grant Counties; a sixth population was found in 1997. Between 1997-2001 five of the six populations disappeared; by March 2001, only one area, Sagebrush Flat, was known to still have rabbits (Fig. 1). Small populations at several sites were extirpated for unknown reasons, other populations were extirpated by known wildfires.



1.2 Management Direction

With the apparent collapse of the pygmy rabbit population in the wild, WDFW evaluated a number of options. Leaving a few remaining rabbits in the wild would encumber the population with extreme risk. WDFW biologists believed the best option was to maintain the unique Washington pygmy rabbit was to collect rabbits from the wild that represent the unique genetic makeup of Washington pygmy rabbits and begin a captive breeding program to raise and release Washington pygmy rabbits.

A decision was made in May 2001 that the WDFW would work to maintain the unique genetics represented by Washington pygmy rabbits and would collect rabbits from the wild to begin a captive breeding program. The goal is to develop a captive population to ensure the maintenance of Washington's unique pygmy rabbits and to reintroduce sufficient numbers of captive-bred rabbits to re-establish populations in suitable habitat. Not all pygmy rabbits were collected from the wild; the decision was only to take enough rabbits to begin a captive breeding program. This decision was supported by the Wildlife Diversity Advisory Council and the Pygmy Rabbit Working Group. WDFW continued to follow those same goals in 2002.

2.0 RECOVERY EFFORTS IN 2002

Recovery actions prior to 2002 included: 1) protection of populations and habitat through purchase of habitat, creation of fire breaks, and control of predators at Sagebrush Flat and in one privately-owned site, 2) surveys for new populations of rabbits, 3) two graduate student studies of pygmy rabbit ecology and habitat relationships, and 4) the creation of linkages between known sites through purchases of shrub-steppe and potential habitat. In the past 5 years, marked progress has been made with The Nature Conservancy and the Bureau of Land Management in acquisition, protection and enhancement of lands surrounding Sagebrush Flat.

In 2000, WDFW biologists trapped pygmy rabbits from Idaho and relocated them to the Oregon Zoo in an effort to learn more about their behavior and to develop husbandry techniques for captive breeding. The captive rabbits adjusted well and 10 young rabbits were produced. In 2001 WDFW biologists trapped 18 Columbia Basin pygmy rabbits in Washington for captive breeding. Activities associated with the captive breeding projects include experimental releases of captive-bred Idaho pygmy rabbits, breeding of Columbia Basin pygmy rabbits, and research associated with captive populations. Genetic analyses of pygmy rabbits are continuing. WDFW developed a Science Team, comprised of University, Zoo and Agency scientists to review and assess progress of pygmy rabbit research, captive breeding, and other science-based recovery activities. The progress made in these areas is discussed below

2.1 2002 results of captive breeding Idaho pygmy rabbits.

The 2002 breeding season was the second breeding season for Idaho pygmy rabbits. Prior to the breeding season, Idaho rabbits were moved from the Oregon Zoo to a facility constructed at WSU that was separate from those containing Washington pygmy rabbits and to another facility at Northwest Trek Wildlife Park. Eleven Idaho pygmy rabbits were involved in captive breeding during 2002, producing 31 offspring. Twenty offspring and 1 adult were released into the wild at the National Environmental and Engineering Laboratory in south-central Idaho during summer 2002, under a graduate research project

supervised by Dr. Rod Saylor of Washington State University (See section 2.2). Three juvenile Idaho pygmy rabbits died of coccidiosis. The remaining eight juvenile pygmy rabbits were retained for captive breeding in 2003. Two additional pygmy rabbits were captured during fall 2002 from Idaho to provide additional genetic diversity to the captive population.

2.2 Release of Idaho pygmy rabbits.

A total of 20 Idaho pygmy rabbits born in captivity in 2002 were released in two groups at the Idaho National Environmental Engineering Laboratory near Idaho Falls, Idaho. The first group of 13 rabbits was released August 9 and the second group of 7 was released September 16. Rabbits were kept in large pre-release pens at Washington State University for 2-4 weeks prior to release. Rabbits were driven from Washington State University and released the same day in Idaho. All rabbits were fitted with radio-transmitters. At the release site, all animals were kept in temporary containment pens for 1 week to acclimatize to the environment. All animals were provided artificial burrows and received supplemental food while in temporary containment.

Pygmy rabbits readily accepted and used artificial burrows. Artificial burrows consist of a 4-6" plastic drain pipe augered into soil in areas of dense sagebrush. Half of the animals dispersed away from their release area, and two of those returned to occupy areas near their release burrows. Eight of 10 dispersing animals were lost within the first two months to predators or unknown causes, while only 2 non-dispersing animals were lost within the first two months to predators. Predators included raptors and coyotes, with a number of additional unknown predator mortalities. Four rabbits survived to breeding season 2003.

Plans for 2003 are to conduct a second year experiment with at least 2 cohorts again, and continue looking at the effects of dispersal on juvenile rabbits and testing the benefits of artificial burrows and food supplementation with a larger sample. Evaluations of habitat use is also planned for 2003.

2.3 Captive breeding of Columbia Basin (Washington) pygmy rabbits.

The 2002 breeding season was the first breeding season for Columbia Basin pygmy rabbits. Eighteen founders began the breeding season; 5 males and 6 females at Washington State University and 3 males and 4 females at the Oregon Zoo. Rabbits were placed together beginning in early March, but breeding did not occur until mid-April. The first litters were born between May 1 and 3.

Of 12 different pairings at Washington State University, only two produced young. One of the pairs produced stillborn young and the other pair produced 5 young. One re-pairing later in the spring produced only stillborn young. At the Oregon Zoo, eight pairings were attempted with only two pairings producing a total of 11 young. Re-matings were not successful, with one re-mating producing two stillborn young. Rabbits were monitored to document courtship behavior, nesting, and breeding. Below is a summary of 2002 results. See Lamson and Shipley (2003) for additional information.

2.3.1 Breeding behaviors.

Behavioral data was collected using color video cameras at the Oregon Zoo in 2002. Cameras were not in place at WSU and Northwest Trek in 2002 but have been added for 2003. Cameras are essential for monitoring interactions and studying behavior. Non-breeding behaviors identified include resting, feeding, drinking, grooming, locomotive behavior, climbing, digging, vocalization and coprophagy (ingestion of fecal material). Breeding behaviors identified include reproductive chase, copulation, nest construction, female spin (where a female rapidly turns her body in the presence of a male), and male/female jump (where a male or female jumps over the other individual).

2.3.2 Nesting behavior.

Pygmy rabbit nests are constructed in three stages; excavation of the nest burrow, gather grass and hay for the nest, and lining the nest with fur. Pregnant females start digging their nest burrows at 6-13 days and gather grass 3-8 days before birth of young. Nest building has been documented occurring both morning and evening.

2.3.3 Births.

Birthing occurs in the morning or late afternoon. Births occur in the burrow entrance, partly to mostly beneath the ground surface. Births occurred in early May and June. Nursing began within 24 hours after birth, and nursing occurred once per day after that. Nursing sessions occurred mostly in the slope of the nest burrow, but sometimes were underground. Kits opened eyes at 10 -11 days and emerged from the burrows at 13 - 15 days. Weaning occurred within a day of emergence.

2.3.4 Juvenile mortality

Six of the fifteen young born in 2002 died their first year. Four died within three weeks of birth from coccidiosis. A fifth juvenile died in 2002 from what was thought to be a bacterial infection, and the sixth death occurred in December 2002 from injury and shock in the pen.

2.3.5 Adult mortality.

Three adult rabbits died between their capture during spring and summer 2001 and prior to the spring 2002 breeding season. Two of the three rabbits died of unknown causes and the third died after falling from a sagebrush plant and getting caught in the plant. After the 2002 breeding season, one adult rabbit died from a tumor that developed on its head, and seven adult rabbits died from avian tuberculosis (*Mycobacterium avium*).

2.3.6 Captive population for 2003 breeding.

Entering the 2003 breeding season there were 19 breeding rabbits in the captive Columbia Basin pygmy rabbit population distributed between WSU and the Oregon Zoo, including 9 yearlings from 2002 and 10 adults. The captive population is made up of 12 females and 7 males. Seven were captured from the wild, the remainder were born in captivity.

2.3.7. Medical issues.

The two principal disease issues of concern for captive pygmy rabbits are coccidiosis and avian tuberculosis. Coccidiosis is caused by a protozoa that invades the intestines and other tissues of animals. Four captive-born Columbia Basin pygmy rabbit young and 3 captive-born Idaho pygmy rabbit young died of intestinal coccidiosis during the 2002 breeding season. The species of coccidia infecting pygmy rabbits is under study, but has not been positively identified. Antibiotics have been effective at decreasing parasite loads. Since the deaths in spring 2002, coccidia levels are now monitored in captive pygmy rabbits. If coccidia levels become elevated, they are treated with antibiotics.

Avian tuberculosis has been responsible for the deaths of 7 adult Columbia Basin pygmy rabbits in the captive breeding program. It is caused by a bacterium that commonly exists in soil and water, and can survive for long periods of time in soil. High numbers of the bacterium can be shed in feces. The incubation period can be weeks to months, and detection of infected individuals is difficult. The presence of this disease in pygmy rabbits has been cause for concern with veterinarians working on the recovery project. Treatment can take several years and its efficacy in pygmy rabbits is unknown. There may be side-effects of treatment, including reduced reproductive performance. Currently, regular fecal cultures are done on captive rabbits in an attempt to detect subclinically infected animals.

At the present time, it is unclear whether the heavy avian tuberculosis losses in the captive pygmy rabbits are the result of exposure to heavily contaminated soil or are the result of diminished immune system function due to inbreeding in the Columbia Basin population. Preventive measures that have been undertaken include changing soil in pens more frequently and careful selection of replacement soil. Comparative immune system function testing of Columbia Basin and Idaho pygmy rabbits has been undertaken and results will be available during spring 2003. Soil and fecal pellets from known pygmy rabbit sites in the wild were collected during 2002, and tested for avian tuberculosis, with negative results. In addition 11 coyotes and 3 weasels were trapped during winter 2002, and tested for plague and other diseases potentially transmitted to rabbits. No communicable diseases were found.

Skeletal abnormalities were detected in six Columbia Basin rabbits born in captivity during 2002. These abnormalities consisted of missing metatarsal and/metacarpal bones of the feet. As this condition could potentially be a result of inbreeding, all pygmy rabbits will be radiographed during summer 2003, after the breeding season.

2.4 Genetic health of captive Columbia Basin pygmy rabbits.

From 2001 through 2003 Dr. Kenneth Warheit, WDFW conservation geneticist conducted population genetic analyses of pygmy rabbits from Washington, Oregon, Idaho, and Montana (WDFW; unpublished data). These analyses were based on muscle (ear punches) or blood tissue collected in the field, and skin tissue collected from museum specimens. Warheit (unpublished data) analyzed two types of DNA data: molecular sequences from the mitochondrial cytochrome *b* locus, and DNA fragment sizes from nine nuclear microsatellite loci. The cytochrome *b* locus or gene evolves more slowly than that of any of the microsatellite loci, and can provide a measure of genetic isolation at long temporal scales (thousand to millions of years).

Based on the samples analyzed thus far, the cytochrome *b* type (haplotype) from Washington is invariant (i.e., only one haplotype present) and different from the three haplotypes shared among Montana, Idaho, and Oregon populations. The cytochrome *b* and microsatellite data conclusively demonstrate that the Washington pygmy rabbit is isolated and very distinct from other pygmy rabbits and may have been isolated and distinct for thousands of years.

The Washington pygmy rabbit has reduced genetic variability compared with other pygmy rabbit populations. Based on a microsatellite analysis of museum skin samples from Sagebrush Flats, it appears that this reduction in genetic variability has existed for at least 50 years. Furthermore, genetic variability within Washington has continued to decline during the past 50 years in wild pygmy rabbits.

Genetic variability of captive animals has declined since the breeding program was initiated in 2001. In less than two years the captive pygmy rabbit population has lost a total of two microsatellite alleles, and one of the microsatellite loci has become fixed at a single allele. Observed heterozygosity, a measure of genetic diversity, has declined nearly one-third from 0.35 in the founding population to 0.24 today. Moreover, since genetic drift occurs rather swiftly in small populations, many alleles are now present in only a few individuals, and one locus is now one individual away from fixation at a single allele. If this locus becomes fixed, three of the nine microsatellite loci will contain no genetic variability. Finally, the average relatedness among individuals in the captive Columbia Basin pygmy rabbit population is now 0.33, which represents a pairwise relatedness between a full (0.50) and half (0.25) sibling.

2.5 Habitat Management, Restoration and Acquisition.

WDFW is developing native seed sources for restoring old field sites managed for pygmy rabbits. We plan to start using native seed sources in old fields in 2004. Restoration and management efforts by the Bureau of Land Management and The Nature Conservancy are also expected to start utilizing native seeds in 2004.

WDFW has been working with the Bureau of Land Management, private landowners, and The Nature Conservancy to develop a 5,000 to 10,000 acre area suitable for pygmy rabbits in northern Grant County and southern Douglas County. A 2002 grant from the U. S. Fish and Wildlife Service will help acquire lands to recover pygmy rabbits. WDFW, the Bureau of Land Management, U. S. Fish and Wildlife Service, and The Nature Conservancy all began evaluating properties currently owned or managed for long-term pygmy rabbit recovery.

WDFW is working with the Natural Resources Conservation Service (NRCS) to improve soil maps and models to predict potential pygmy rabbit habitat. These maps and models will help identify sites with potential to support pygmy rabbits in the future, sites with current suitable pygmy rabbit habitat, and priorities for pygmy rabbit management and recovery.

The Sagebrush Flat Wildlife Area was not grazed in 2002. WDFW has no plans for grazing cattle on Sagebrush Flat Wildlife Area in 2003. Crews began removing old fence-posts and fence lines internal to the wildlife area to reduce potential perches for predators, such as short-eared owls, harriers, red-tailed hawks, rough-legged hawks and ravens.

2.6 Surveys for pygmy rabbits

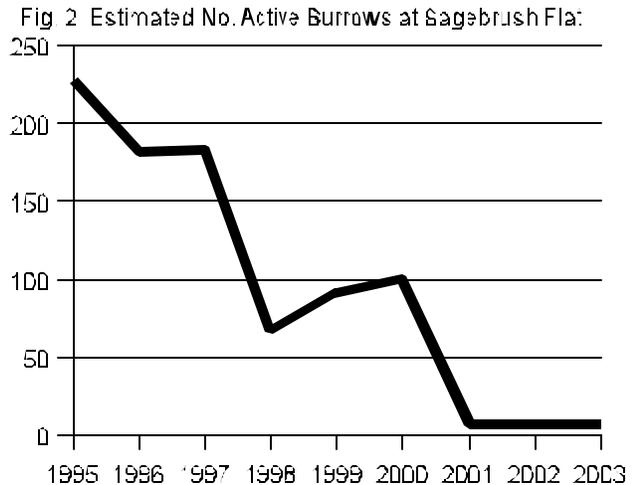
Numbers of active burrows have been estimated from standardized plots since 1995 on Sagebrush Flat, where the largest concentration of rabbits was known to occur. Estimates declined from 229 in 1995 to zero in 2001 (Fig. 2). Random searches did reveal some active burrows at Sagebrush Flat and a few rabbits were seen on the site in March and April 2001. Similar random searches revealed 68 active burrows in Fall 2000, 37 in December, and 8 in March 2001.

A complete survey of Sagebrush Flat Wildlife Area was conducted in between fall 2001 and January 2002. The survey found 23 burrows of pygmy rabbits that were determined to be active or intermittently used by pygmy rabbits. These were located in three general areas. Because pygmy rabbits are difficult to census, we survey active burrows to give us general estimates of numbers. It is likely due to the difficulties of surveying that not all active burrows were located. Monitoring during spring, summer, and fall 2002 indicated that rabbits were still present at Sagebrush Flat Wildlife Area.

WDFW monitored known active burrows during December 2002 and found active burrows in one of the 3 general areas previously known. In this area, 6 of 7 burrows active during the 2001-2002 survey were still active, and in addition 5 newly active or constructed burrows were located. Additional scattered unknown active burrow may occur through movement of rabbits throughout the year.

The Bureau of Land Management surveyed 40 sections of land for pygmy rabbits during spring and summer 2002. These areas were located in the Saddle Mountain, Beezley Hills, Moses Coulee, and Duffy Creek areas of Grant and Douglas counties. No pygmy rabbits were found and no evidence of past use by pygmy rabbits was detected.

In 2001, WDFW biologists surveyed 39 sites for pygmy rabbits, predominately on public lands, encompassing all or part of 167 sections in Douglas, Grant, Lincoln, and Adams counties. In 2002, WDFW surveyed an additional 20 sites, encompassing 30 sections. Although evidence of likely historical use by pygmy rabbits was found at a number of sites, no rabbits or signs of activity were seen. Surveys for pygmy rabbits will continue in 2003, focusing on additional unsurveyed public lands. Surveys occur on private lands only with agreement by the landowners.



2.7 2002 Research projects and results.

Three graduate students at Washington State University are studying captive rabbits from Washington and Idaho. Graduate student Rob Westra is working on the experimental release of Idaho pygmy rabbits back into Idaho (preliminary results discussed above). Becky Elias is studying reproductive behavior and strategies of Columbia Basin pygmy rabbits and rabbits from Idaho. Tara Davila is studying nutrition of pygmy rabbits, specifically protein and tolerance for fiber and plant toxins. She is also comparing reproductive physiology of Columbia Basin pygmy rabbits and rabbits from Idaho. The project studying release of captive rabbits into Idaho will continue through 2004. The other two projects were initiated in 2002 and will be completed in 2004 or 2005. Genetics research is discussed in section 2.4. Dr. Janet Rachlow at the University of Idaho has several projects underway with Idaho pygmy rabbits that will provide valuable information for conservation of Washington pygmy rabbits, including estimating pygmy rabbit abundance from burrow activity.

In 2002 a master's thesis at Washington State University was completed by Nicole Siegel on the ecology of pygmy rabbits at Sagebrush Flat Wildlife Area. The thesis contains sections on the effects of cattle grazing on behavior and habitat of Columbia Basin pygmy rabbits and a discussion of the compatibility of cattle and pygmy rabbits. She concluded that her results suggest grazing did not benefit pygmy rabbits at Sagebrush Flat Wildlife Area and had both neutral and negative effects on pygmy rabbit habitat and behavior. Her study found that cattle reduced both the quantity and quality of forage, pygmy rabbits consumed more grasses and forbs in ungrazed areas in summer and winter, and rabbits selected ungrazed areas preferentially over grazed areas for burrowing.

Concerns over the avian tuberculosis cases in 2002 prompted contacts with immune system researchers at the National Institute of Health (NIH). Dr. Terry Philips with the NIH agreed to study immune system function in captive pygmy rabbits. He has conducted preliminary assessments of both Columbia Basin and Idaho pygmy rabbits, and we expect final results by late spring 2003.

3.0 REVISED RECOVERY STRATEGIES

In addition to recovery tasks outlined in the original recovery plan and 2001 addendum, the following tasks are a priority for action in 2003:

3.1. Conduct experimental cross - breeding of rabbits from the Columbia Basin and Idaho.

The dramatic decline in the genetic health of the captive population of Columbia Basin pygmy rabbits is of concern, especially because there are distinct signs that this population may be nearing fixation of deleterious genetic variants (e.g., reduced reproductive success, possible increased susceptibility to disease such as avian tuberculosis, and birth defects such as bone abnormalities). If the captive Columbia Basin pygmy rabbit population remains closed to the introduction of new individuals, deleterious genetic variants may result in the eventual extinction of the population. The genetic restoration of the Columbia Basin pygmy rabbits may require the introduction of Idaho rabbits into the captive breeding program. This approach was used for the Florida panther recovery program (Hedrick 1995).

We plan an experiment in 2003 to determine whether Columbia Basin and Idaho pygmy rabbits can interbreed. The experiment will be conducted with wild caught pygmy rabbits from Idaho, and with Columbia Basin pygmy rabbits that we cannot breed in 2003 due to their current genetic over-representation in the captive population (there are currently 3 female Columbia Basin pygmy rabbits that we are not breeding with other Columbia Basin pygmy rabbits). The interbreeding experiment will be conducted at the Oregon Zoo at a separate facility from the ones that house Washington rabbits, and all wild caught rabbits will be subject to quarantine.

3.2. Expand captive breeding facility at Northwest Trek Wildlife Park.

The Northwest Trek Wildlife Park facility currently has space for only 4 adults pygmy rabbits. We would like to expand the facility to house between 12 and 15 Columbia Basin pygmy rabbits, which would provide similar numbers to those housed at the Oregon Zoo and Washington State University. Expansion will occur if breeding in 2003 is successful in producing the needed additional rabbits.

3.3 Develop criteria and evaluate areas for reintroduction of pygmy rabbits in Washington.

An assessment of Columbia Basin habitat needs to be conducted to identify two areas for initial reintroduction of pygmy rabbits and alternate sites in case catastrophic fire or disease temporarily reduces habitat quality. We will work with other biologists and land managers within the Columbia Basin to develop biological criteria for evaluation of potential pygmy rabbit habitat. Soil layers developed by the U. S. Natural Resource Conservation Service will be combined with WDFW data on remaining shrub-steppe habitat in the Columbia Basin. Potential sites will be field evaluated to assess habitat quality and ranked. The evaluation should focus on public land and private conservation lands (like The Nature Conservancy ownership) where management is interested in conservation of pygmy rabbits.

3.4. Develop “safe harbor” type working agreements with private landowners.

The U. S. Fish and Wildlife Service has a number of types of agreements with private landowners that can be developed, such as Habitat Conservation Plans and Safe Harbor Agreements, that can clarify private landowner responsibility under the Endangered Species Act and provide assurances to private landowners if endangered pygmy rabbits come onto their lands.

Due to the decline in genetic diversity in Washington pygmy rabbits, it is urgent that we find any remaining wild Columbia Basin pygmy rabbits as soon as possible. Most landowners want assurances from the U. S. Fish and Wildlife Service on the potential affect of the Endangered Species Act prior to allowing WDFW or others to survey their land for pygmy rabbits. Landowner contacts in potential pygmy rabbit habitat need to increase in 2003 and agreements such as “safe-harbor” agreements are critical to the conservation of the species. In addition, safe harbor agreements will be valuable to private landowners surrounding areas where pygmy rabbits will be reintroduced. These agreements can also protect landowner rights where rabbits currently occur on their lands.

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